

WE CLAIM:

1. A device for insertion into a body of a subject being treated, the device delivering localized x-ray radiation, comprising:

a shaft, including a proximal and a distal portion;

a vacuum housing coupled to the distal portion of the shaft;

an anode disposed within the vacuum housing; and
a cathode structure disposed within the vacuum housing, the cathode structure including a thin diamond film, the thin diamond film being operative with the anode to produce the localized x-ray radiation.

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2. The device of claim 1 further comprising a voltage source coupled to the proximal portion of the shaft and operative with the anode and cathode structure to produce the localized x-ray radiation.

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3. The device of claim 1 further comprising a getter disposed within the vacuum housing.

4. The device of claim 1 wherein the cathode structure further comprises a getter on which the thin diamond film is disposed.

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5. The device of claim 4 wherein the getter is sufficiently conductive to facilitate the application of an electric potential to the thin diamond film.

5 6. The device of claim 4 wherein the getter is comprised of approximately 70% zirconium, 24.6% vanadium, and 5.4% iron.

7. The device of claim 1 wherein the vacuum
10 housing further comprises an insulator.

8. The device of claim 1 wherein the anode is comprised of tungsten.

15 9. The device of claim 1 wherein the cathode structure is comprised of a molybdenum base on which the thin diamond film is disposed.

10 10. The device of claim 1 wherein the cathode structure is comprised of a silicon base on which the thin diamond film is disposed.

11. The device of claim 1 wherein the cathode structure is comprised of a tantalum base on which the thin
25 diamond film is disposed.

12. The device of claim 1 wherein an outer diameter of the integrated device is less than or equal to approximately two and one-half millimeter.

